REPORT DOCUMENTATION PAGE

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13. ABSTRACT *(Maximum 200 words)*

This project addresses key compnent technologies for enabling the fusion of data between the transmission lines and the receivers in optical communication network systems. This year involved the optimization and testing of an integrated flip-flop device, fabrication of an integrated divide-by-8 optical clock counter/sequencer, and development of a serial to parallel converter.

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The aim of this project was to demonstrate the use of optoelectronic feedback to realize hybrid all-optical switching devices which when integrated can form functional circuits. The devices chosen for demonstration were an integrated flip-flop device, an integrated divide-by-8 optical clock counter/sequencer, and a serial to parallel converter. The important results were:

- Fabrication and optimization of MSM structures at waveguide outputs and integration into a complete flip-flop device. The past years work involved the completion of the optoelectronic feedback for flip-flop operation
- Fabrication, characterization, and optimization of an ultrafast all-optical demultiplexer. The past years work involved the fabrication of a fully integrated device using an improved mask set and determination of the tolerance of the device operating characteristics to high repetition rate switching.

Publications:
X. dong, P. LiKamWa, J. Loehr, and R. Kaspi, "Current-induced guiding and beam steering in active semiconductor planar waveguide," IEEE Photon. Tech. Lett., V11, PP.809-811, July 1999.

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Inventions:
Monolithic Integrated Active Semiconductor Optical Waveguides for 1xN Interconnect Switch